Claims:

1. An auto exhaust gas emission control device of the type comprising a permeable silicon-carbide substrate contained within a metallic housing is disclosed with sufficient clearance between the housing and the substrate to permit the thermal expansion of the substrate within the housing when the device is heated from ambient to operating temperature, the substrate being positioned within the housing and in use the gas being directed through the substrate by an intumescent gasket the improvement comprising:

the metal of the metallic housing having a coefficient of thermal expansion equal to or greater than $18x10^{-6}$ centimeter per degree Celsius;

the improvement providing reduced frequency of substrate failure and wear on the gasket in use.

2. The device of claim 1, wherein said operating temperature is the temperature of the exhaust gas of an internal combustion engine.

3. The device of claim 2, wherein said operating temperature is the temperature of the exhaust gas of a diesel fueled internal combustion engine.

4. The device of claim 1, wherein said metal comprises a metal selected from the group consisting of austenitic steel.

5. The device of claim 4, wherein said metal comprises austenitic stainless steel.

6. The device of claim 5, wherein said metal is austenitic stainless steel.

7. The device of claim 1, wherein said intumescent gasket further comprises a material selected from the group consisting of mica ceramic fiber, vermiculite, alkali metal silicates, expandable graphites and mixtures thereof.

8. A gasket is particularly adapted to inhibit the flow of gas in a space formed by adjacent parallel walls while simultaneously permitting an exchange of thermal energy between said gas and at least one of said walls, comprising:

a member which in use inhibits the flow of said gas said member having at least one channel sufficient to permit access of said gas in sufficient proximity to the surface of said wall for a portion of an interface between said member and said wall to permit exchange of thermal energy between a gas contained within said channel and said wall.

9. The gasket of claim 8, wherein said member comprises an intumescent material.

10. The gasket of claim 9, wherein said member further comprises a material selected from the group consisting of mica ceramic fiber, vermiculite, alkali metal silicates, expandable graphites, and mixtures thereof.

11. The gasket of claim 10, wherein said intumescent material is mica ceramic fiber.

12. The gasket of claim 8, wherein said channel permits fluid communication of said gas with said wall.

13. The gasket of claim 12, wherein said member comprises mica ceramic fiber, vermiculite, alkali metal silicates, expandable graphites, and mixtures thereof.

14. The gasket of claim 13, wherein said member comprises mica ceramic fiber.

15. The gasket of claim 8, wherein said member inhibits the flow of gas when said gasket is compressed to a density of at least about 0.8 g/cc.

16. A gasket particularly adapted to inhibit the flow of a gas in a space formed by a permeable silicon-carbide substrate mounted within a metallic housing in a catalytic converter device while simultaneously permitting exchange of thermal energy between said gas and said metallic housing, comprising:

an intumescent, gas impermeable member comprising mica ceramic fiber having at least one channel that permits fluid communication of said gas with said housing for a portion of the surface of the interface of said member and said housing.

17. An emission control device, comprising:

a treatment element comprising a silicon-carbide substrate, contained within a metallic housing to permit expansion of the treatment element when the emission control device is heated to an operating temperature; and ports in the housing to provide for inlet and exhaust of a gas;

the treatment element being positioned and affixed within the housing by a gasket being particularly adapted to simultaneously inhibit the flow of gas in a space defined by the treatment element and the housing between the ports in the housing while permitting the exchange of thermal energy between the gas and at least one of the housing and the treatment element by at least one channel in the gasket to permit access of the gas in proximity of the housing or the treatment element for a portion of the interface between the gasket and the housing or the treatment element.

18. The emission control device of claim 17, wherein said gasket comprises an intumescent material.

19. The emission control device of claim 18, wherein said intumescent material comprises a material selected from the group consisting of mica ceramic fiber, vermiculite, alkali metal silicates, expandable graphites, and mixtures thereof.

20. The emission control device of claim 19, wherein said intumescent material comprises a mica ceramic fiber.

21. The emission control device of claim 17, wherein said treatment element is positioned and affixed within said housing by said gasket such that said treatment element does not contact said housing.

22. The emission control device of claim 21, wherein said gasket material comprises an intumescent material.

23. The emission control device of claim 22, wherein said intumescent material comprises a material selected from the group consisting of mica ceramic fiber, vermiculite, alkali metal silicates, expandable graphites, and mixtures thereof.

24. The emission control device of claim 23, wherein said intumescent material comprises a mica ceramic fiber.

25. An emission control device housing, comprising:

nested metallic housings comprising an inner housing and an outer housing, said nested metallic housings both having input ports and exhaust ports, said inner housing being configured with said outer housing to form at least one channel between said inner housing and said outer housing to:

permit the exchange of thermal energy between said inner housing end said outer housing and at least a portion of a gas flowing from said input port to said exhaust port of said outer housing; and

limit the flow of said gas through said device through said input port of said inner housing.

26. The emission control device housing of claim 25, wherein said exhaust port of said outer housing is merged with said exhaust port of said inner housing.

27. The emission control device housing of claim 25, wherein the outermost wall of said outer housing is continuous with the innermost wall of said inner housing.

28. The emission control device housing of claim 25, wherein the innermost wall of said outer housing is continuous with the outermost wall of said inner housing.

29. The emission control device housing of claim 25, wherein said inner housing is joined to said outer housing by an member that inhibits the flow of gas between said input and exhaust ports of said outer housing.

30. An emission control device canister comprising:

nested metallic housings comprising an outer housing having inlet means and outlet means for a gas stream to be treated; and

an inner housing connected to at least a portion of the outer housing to form a channel between the outer and inner housings, the connection also sealing off the gas path of the outer housing to prevent free passage from the inlet means to the outlet means to ensure that at least a portion of gas flows into the channel and that substantially all of the gas flows through the inner housing to permit an exchange of thermal energy between the gas and the housings.

31. An emission control device housing for an exhaust gas having thermal energy comprising:

an outer metallic housing having gas flow inlet means and outlet means; and

an inner metallic liner for said housing being attached to at least a portion of said outer housing so as to form a channel between said housing and said liner, said channel being open on at least one end,

said attachment being gas impermeable to direct the flow of at least a portion of the gas to the channel and to the inner metallic liner to permit exchange of at least a portion of the thermal energy contained in the gas with the housing and the liner.

32. An emission control device, comprising:

nested metallic housings comprising an inner housing and an outer housing, the nested metallic housings both having input ports and output ports, the inner housing configured with the outer housing to form at least one channel between the inner housing and the outer housing to:

permit the exchange of thermal energy between at least a portion of a gas flowing from the input port to the exhaust port of the outer housing;

and limit the flow of a gas through the device through the input port of the inner housing;

a treatment element comprising a silicon-carbide substrate disposed within the inner housing;

wherein the treatment element is affixed within the inner housing by a gasket, which gasket is sufficient to inhibit the flow of a gas around the substrate and to prevent the substrate from contacting the housings.

33. The emission control device of claim 32, wherein said exhaust port of said outer housing is merged with said exhaust port of said inner housing.

34. The emission control device of claim 32, wherein the innermost wall of said outer housing is continuous with the outermost wall of said inner housing.

35. The emission control device of claim 32, wherein said gasket comprises an intumescent material.

36. The emission control device of claim 35, wherein said intumescent material is further comprised of a material selected from the group consisting of mica ceramic fibers, vermiculite, alkali metal silicates, expandable graphites, and mixtures thereof.

37. The emission control device of claim 36, wherein said intumescent material is comprised of mica ceramic fibers.